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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,717	06/27/2003	Steven J. Martin	58633US002	9412

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EXAMINER	
MARKHAM, WESLEY D	

ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 07/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/607,717	MARTIN ET AL.	
	Examiner	Art Unit	
	Wesley D Markham	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/1/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1 – 25 are currently pending in U.S. Application Serial No. 10/607,717, and an Office Action on the merits follows.

Information Disclosure Statement

2. The IDS filed by the applicant on 10/1/2003 is acknowledged, and the references listed thereon have been considered by the examiner as indicated on the attached copy of the PTO-1449 form.

Drawings

3. The one (1) sheet of formal drawings filed by the applicant on 6/27/2003 is acknowledged and approved by the examiner.

Specification

4. The use of the trademarks ALCONOX, RBS-PF, HFE-7100, HFE-7200, CRIZAL, UNISLIDE, and SHARPIE has been noted in this application (see pages 10, 14, and 16 – 18 of the specification). They should be capitalized wherever they appear and be accompanied by the generic terminology. Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner that might adversely affect their validity as trademarks.

Claim Objections

5. Claims 21 and 22 are objected to because of the following informalities:

   - Claim 21, line 1: The phrase, "the fluorinated silane precursor comprise..." appears to contain a typographical error and should read, "the fluorinated silane precursor comprises..."
   - Claim 22, last line: The phrase, "; and" at the end of the claim appears to be a typographical error and should be deleted and replaced by a period (i.e., because there is no further text after the word "and", and thus the word is unnecessary and confusing).

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order

for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1, 2, 4 – 8, 10 – 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Invie et al. (USPN 6,277,485 B1) in view of either the applicant's admitted prior art (AAPA) or Nippon Sheet Glass (referred to hereinafter as Nippon) (JP 2002-187740 A), in further view of Birch (US 2004/0043142 A1).
9. Regarding independent **Claim 1** (from which Claims 2 – 25 depend), Invie et al. teaches a method for applying an antisoiling coating on an article (title and abstract), the method comprising providing an article comprising an optical substrate (Col.1, lines 6 – 14, Col.3, lines 46 – 52, and Col.4, lines 32 – 56) and an antireflective coating (ARC) disposed on a surface of the optical substrate (abstract, Col.1, lines 15 – 62, Col.2, lines 52 – 55, Col.3, lines 46 – 67, Col.4, lines 1 – 32, Col.5, lines 51 – 67, and Col.6, lines 1 – 8), and applying an antisoiling coating comprising silicon that is disposed on at least a portion of the ARC, wherein the ARC is between the optical substrate and the antisoiling coating (abstract, Col.1, lines 53 – 67, Col.2, lines 24 – 63, Col.5, lines 51 – 67, Col.6, lines 34 – 67, and Cols.7 – 10 (for the specifics of the antisoiling composition and its application)). Invie et al. does not explicitly teach replacing the antisoiling coating by treating the article with a plasma under vacuum conditions to remove the previously applied antisoiling coating and disposing a new antisoiling coating on the ARC of the article. However, the AAPA teaches that, in the art of antisoiling coatings deposited on ARC-coated optical

substrates, the antisoiling coatings may need to be removed and replaced at times, such as when a previously applied antisoiling coating becomes defective or partially removed during the use of the article ("Background" section of the applicant's specification, page 2, lines 11 – 15). Nippon also teaches that, in the art of water-repellent fluorosilane coatings (i.e., antisoiling coatings) on optical substrates (e.g., glass or silica-coated glass), the aforementioned coatings deteriorate over time and must be removed (i.e., to provide a clean surface) and replaced (paragraphs [0010], [0020], [0021], [0027], [0057], and [0070] of the translation). Therefore, it would have been obvious to one of ordinary skill in the art to remove the previously deposited antisoiling coating of Invie et al. (i.e., when such coating deteriorates and/or becomes defective over time and through use) and dispose a new antisoiling coating on the ARC of the article of Invie et al. (as taught by either the AAPA or Nippon) with the reasonable expectation of successfully and advantageously renewing the antisoiling capability of the ARC-coated optical substrate, thereby prolonging the use of the aforementioned substrate (i.e., due to the renewed antisoiling coating). The combination of Invie et al. and either the AAPA or Nippon does not explicitly teach removing the antisoiling coating by treating the article with a plasma under vacuum conditions. However, Birch et al. teaches a method of removing a hydrophobic coating from a glass substrate by plasma cleaning under vacuum conditions (Abstract, paragraphs [0012] and [0048] – [0056]). Removing the coating by the vacuum plasma cleaning process of Birch et al. has the following advantages: (1) effective removal of a wide variety of coatings (paragraphs [0012], [0037], and

[0040]), (2) no generation of liquid waste (paragraph [0012]), (3) the ability to remove thicker coatings while leaving behind virtually no visible residue (paragraph [0014]), and (4) inexpensive operation, generates no regulated waste streams, and produces clean surfaces in very short time periods (paragraph [0054]). Further, the vacuum used in the plasma cleaning facilitates uniformity through dispersion of the plasma and therefore quickly and effectively cleans the entire surface of the material simultaneously and evenly (paragraph [0056]). Therefore, it would have been obvious to one of ordinary skill in the art to remove the antisoiling coating of Invie et al. by treating the article with a plasma under vacuum conditions (as taught by Birch et al.) with the reasonable expectation of successfully and advantageously removing the coating by using a method that does not generate waste, leaves behind virtually no residue, is inexpensive to operate, and produces clean surfaces in very short time periods and with a high uniformity.

10. The combination of Invie et al., either the AAPA or Nippon, and Birch et al. teaches all the limitations of **Claims 2, 4 – 8, 10 – 23, and 25** as set forth above in paragraph 9 and below, including a method wherein / further comprising:

- Claim 2: The pressure during the plasma treating is in the range of 0.05 to 0.5 mm Hg (paragraph [0053] of Birch et al.).
- Claim 4: The plasma treating leaves the ARC and the optical substrate intact. Specifically, Birch et al. makes no mention or suggestion that the plasma cleaning process used to remove a coating on an article significantly damages or modifies the underlying substrate. Additionally, Nippon teaches

that, in the art of removing a water repellent film from a substrate by using a plasma, the underlying substrate should be left intact (paragraph [0027]). Therefore, it would have been obvious to one of ordinary skill in the art to perform the plasma cleaning process of the combination of Invie et al., either the AAPA or Nippon, and Birch et al. under conditions such that the underlying substrate (i.e., the ARC-coated optical substrate of Invie et al.) is left intact because by doing so, one would insure that the ARC-coated substrate is not damaged, thereby achieving the goal of the combination of Invie et al., either the AAPA or Nippon, and Birch et al. (i.e., simply replacing a damaged or worn antisoiling coating on an ARC-coated substrate).

- Claims 5 and 6: The treating removes less than 500 A of the antisoiling coating (Claim 5), particularly less than 100 A of the antisoiling coating (Claim 6). Specifically, Invie et al. teaches that the antisoiling coatings have a thickness of about 15 A to about 150 A (Col.2, lines 56 – 63). Therefore, it would have been obvious to one of ordinary skill in the art to remove less than 100 A of the antisoiling coating of Invie et al. because, when the coatings have an overall thickness of less then 100 A (e.g., 15 A, as taught by Invie et al.), no more than the thickness of the coating can be removed. For example, when a 15 A coating is used as the antisoiling coating in the process of Invie et al., the amount of coating removed by the plasma process is at most 15 A (i.e., the entire coating), which is a value within the applicant's claimed range.

- Claim 7: Washing the article, placing the article in an ultrasonic bath, chemically treating the article, or a combination thereof prior to the plasma treating (Col.11, lines 1 – 4 of Invie et al.).
- Claim 8: The article is an optical lens (Col.1, line 7 of Invie et al.).
- Claims 10 – 12: The ARC comprises a metal oxide, metal sulfide, metal halide, metal nitride, or combination thereof, particularly at least one metal oxide layer, particularly wherein an outer layer of the ARC comprises silicon oxides (Col.4, lines 8 – 31, Col.5, lines 54 – 57 of Invie et al.).
- Claims 13 and 14: The plasma is produced using argon, xenon, air, water, oxygen, or a combination thereof, particularly air (paragraphs [0049] and [0050] of Birch et al.).
- Claims 16, 18, 21, and 22: The antisoiling coating comprises a siloxane, particularly a fluorinated (di)alkylsiloxane, perfluoropolyether siloxane, or combination thereof, particularly produced from a fluorinated silane precursor comprising a compound having the formula claimed by the applicant in Claims 21 and 22 (abstract, Col.2, lines 29 – 51, Col.6, lines 34 – 46 and 64 – 67, and Cols.7 – 9 of Invie et al., which describe in detail the silane precursors and siloxane coatings claimed by the applicant).
- Claims 15 and 17: The antisoiling coating(s) has/have a static water contact angle of at least 80 degrees and is/are hydrophobic and/or oleophobic. The combination of Invie et al., either the AAPA or Nippon, and Birch et al. does not explicitly teach these limitations. However, as set forth in the discussion of

Claims 16, 18, 21, and 22 immediately above, the antisoiling coatings taught by Invie et al. are the same as the applicant's claimed and disclosed coatings. Therefore, the antisoiling coatings taught by Invie et al. would have inherently possessed the applicant's claimed water contact angle, hydrophobicity, and oleophobicity (i.e., because these properties are simply inherent properties of a coating that are determined by the coating material used – since the same coating material is used, the coatings would have the same physical and chemical properties).

- Claims 19 and 20: The disposing comprises providing a solution of a fluorinated silane or fluorinated siloxane precursor in an inert solvent, particularly an alkyl perfluoroalkyl ether, and immersing the plasma treated article into the solution (Col.9, lines 39 – 54, and Col.10, line 19 of Invie et al.).
- Claim 23: The disposing comprises placing a fluorinated silane or fluorinated siloxane precursor on a fabric, and transferring the precursor from the fabric to a surface of the plasma treated article. Specifically, Invie et al. does not explicitly teach this limitation. However, the fluorinated silane or fluorinated siloxane precursor application method used by Invie et al. does not appear to be particularly limited or critical (Col.10, lines 17 – 25). Nippon teaches that it was known in the art at the time of the applicant's invention to apply a water repellent fluorinated silane treatment solution to a coated glass substrate by placing the solution on a cotton cloth (i.e., a fabric) and then transferring the

solution from the fabric to a surface of the article (paragraphs [0057] – [0059]). Therefore, it would have been obvious to one of ordinary skill in the art to apply the antisoiling coating of Invie et al. by placing the fluorinated silane or fluorinated siloxane precursor of Invie et al. on a fabric, and transferring the precursor from the fabric to a surface of the plasma treated article with the reasonable expectation of success and obtaining similar results (i.e., successfully re-applying the antisoiling coating to the ARC-coated optical article, regardless of the specific method used to apply the coating).

- Claim 25: Curing the new antisoiling coating (Col.10, lines 56 – 67 of Invie et al.).

11. Claims 4 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Invie et al. (USPN 6,277,485 B1) in view of the applicant's admitted prior art (AAPA), in further view of Birch (US 2004/0043142 A1), and in further view of Nippon.

12. The combination of Invie et al., the AAPA, and Birch teaches all the limitations of **Claims 4 and 23** as set forth above in paragraph 9, except for a method wherein the plasma treating leaves the ARC and the optical substrate intact (Claim 4), and the disposing comprises placing a fluorinated silane or fluorinated siloxane precursor on a fabric, and transferring the precursor from the fabric to a surface of the plasma treated article (Claim 23). However, the aforementioned limitations would have been obvious to one of ordinary skill in the art in view of Nippon for the reasons set forth above in paragraph 10 (see the discussions of Claims 4 and 23).

13. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Invie et al. (USPN 6,277,485 B1) in view of either the applicant's admitted prior art (AAPA) or Nippon (JP 2002-187740 A), in further view of Birch (US 2004/0043142 A1), and in further view of Patrick et al. (USPN 5,474,648).

14. The combination of Invie et al., either the AAPA or Nippon, and Birch teaches all the limitations of **Claim 3** as set forth above in paragraph 9, except for a method wherein the plasma during the treating has an RF power less than about 30 W. Specifically, Birch teaches using an RF plasma for the vacuum plasma removal of the coating (paragraph [0054]) but is silent regarding the RF power utilized. Patrick et al. teaches that, in the art of RF plasma etching or removing of material, the amount of power in the plasma chamber greatly affects process conditions such as etching rate and other process variable parameters and therefore should be controlled to improve etch rate uniformity and consistency (abstract, Col.2, lines 13 – 45, Col.5, lines 9 – 25). In other words, Patrick teaches that RF power in a plasma process is a controllable result / effective variable that greatly affects the overall process (i.e., other process conditions, etching rate, etc.). Therefore, it would have been obvious to one of ordinary skill in the art to optimize and control the RF power in the plasma film removal process of the combination of Invie et al., either the AAPA or Nippon, and Birch as a result / effective variable through routine experimentation. The exact RF power utilized would, of course, depend on the desired film removal rate, the thickness of the film, etc.

15. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Invie et al. (USPN 6,277,485 B1) in view of either the applicant's admitted prior art (AAPA) or Nippon (JP 2002-187740 A), in further view of Birch (US 2004/0043142 A1), and in further view of Matsuo et al. (USPN 4,687,707).

16. The combination of Invie et al., either the AAPA or Nippon, and Birch teaches all the limitations of **Claims 8 and 9** as set forth above in paragraph 9, except for a method wherein the article is an optical / ophthalmic lens. However, it is clear from Invie et al. that the optical article comprising the ARC coating and the antisoiling coating can be a lens in general (Col.1, line 7). Matsuo et al. teaches that ARCs and antisoiling coatings are typically deposited on optical lenses such as eyeglass lenses (i.e., ophthalmic lenses) so that such lenses exhibit desirable antireflective and antisoiling properties (abstract, Col.1, lines 5 – 26, and Col.8, lines 8 – 14). Therefore, it would have been obvious to one of ordinary skill in the art to perform the process of the combination of Invie et al., either the AAPA or Nippon, and Birch on eyeglass lenses (i.e., ophthalmic lenses) with the reasonable expectation of successfully obtaining the benefits of performing the process (i.e., renewing the antisoiling coating on a lens) on a well-known species of lens (i.e., an eyeglass lens) out of the broader genus of lenses generally taught by Invie et al.

17. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Invie et al. (USPN 6,277,485 B1) in view of either the applicant's admitted prior art (AAPA) or

Nippon (JP 2002-187740 A), in further view of Birch (US 2004/0043142 A1), and in further view of Goodwin (USPN 5,707,740).

18. The combination of Invie et al., either the AAPA or Nippon, and Birch teaches all the limitations of **Claim 24** as set forth above in paragraph 9, except for a method further comprising acid activating a surface of the plasma treated article (i.e., the article having the worn or deteriorated antisoiling coating removed) prior to disposing the new antisoiling coating thereon. However, Goodwin teaches that it is desirable to acid activate a surface of a coated optical substrate prior to depositing a water repellent silane or siloxane coating thereon in order to improve the durability of the subsequently deposited water repellent coating (abstract, Col.1, lines 20 – 24 and 53 – 67, Col.2, lines 30 – 45, Col.3, lines 47 – 67, Col.4, lines 63 – 67, and Col.5, lines 26 – 35 and 59 – 64). Therefore, it would have been obvious to one of ordinary skill in the art to acid activate the surface of the plasma treated article (i.e., the article having the worn or deteriorated antisoiling coating removed) of the combination of Invie et al., either the AAPA or Nippon, and Birch prior to disposing the new antisoiling coating thereon with the reasonable expectation of successfully and advantageously improving the durability of the coating, thereby increasing the amount of time before the antisoiling coating is deteriorated and needs to be removed and replaced.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (571) 272-1422. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WDM

Wesley D Markham
Examiner
Art Unit 1762

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